

APPENDIX O -- PUBLIC AND AGRICULTURAL WATER SUPPLY

CONTENTS

Public Water Supply Demands.....	O-1
Agricultural Water Supply Demands	O-2
Summary of Data from the SFWMD Water Use Permit Database.....	O-2
Table O-1. WATER SUPPLY DEMANDS WITHIN THE LOXAHATCHEE WATERSHED	O-7
Table O-1. WATER SUPPLY DEMANDS WITHIN THE LOXAHATCHEE WATERSHED	O-8
Literature Cited	O-10

Public Water Supply Demands

Water for urban and agricultural uses in the Loxahatchee watershed is supplied from both groundwater and surface water systems. Non-environmental surface water demands within the basin are primarily public water supply, commercial and industrial with some agricultural uses. The commercial and industrial demands vary greatly by type of business. In the Loxahatchee Watershed commercial and industrial demands are less than one percent (1%) of the overall water demands. Because the demand is relatively small and difficult to generalize, an average demand was not calculated for this use category and emphasis was placed on estimation of agricultural and urban uses.

Total public water supply demands for the major utilities within this area for 1995 were estimated for the Lower East Coast Regional Water Supply Plan (LECRWSP -- SFWMD, 2000e) and are summarized in **Table O-1**. Total 1995 demands were estimated as 28,384 acre feet/year. Largest users within the watershed consisted of Seacoast Utilities (16,185 ac-ft/year), Town of Jupiter (10,629 ac-ft/year) and the Town of Tequesta. Together these three utilities represent more than 99% of the total urban water supply demand within the watershed.

Because public water supply withdrawals were an issue of concern in this watershed, additional analyses were undertaken by the SFWMD to update the analysis used in the LECRWSP. Recent monitoring and reporting data were analyzed as well as information provided in applications for permit renewals. This analysis and the results are described in detail in **Chapters 4 and 5**.

Table O-1. Urban water supply demands in the Loxahatchee Basin

Permittee	Permit Number	1995 Demands	
		Million Gallons/Year	Acre-feet/year
Seacoast	50-00365-W	5,274	16,185
Town of Jupiter	50-00010-W	3,464	10,629
Tequesta	50-00046-W	515	1,579
PB Park Commerce	50-01528-W	4	11
Total		9,253	28,384

Source: SFWMD Unpublished Consumptive Use Permit Data

Agricultural Water Supply Demands

A different procedure was adopted for estimating agricultural use in the Loxahatchee watershed because measured withdrawal data were not available. The procedure used was to estimate current water use based on Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) water demand modeling (Smajstrla 1990, Moraga et al. 1995), and current agricultural acreage (FDEP 1998). Agricultural water use depends on the crops that are grown in the watershed and on how those crops are managed and irrigated. An important factor in accurately estimating agricultural water use is determining the location and acreage of crops. Citrus and small vegetables are crops found in the basin. The supplemental irrigation requirements for 1995 are found in **Table O-2**.

Table O-2. Agricultural Demands for the Sub-Basins in the Loxahatchee River Basin.

Subbasin No.	Subbasin Name	1-in-2 Agriculture Demands (ac-ft/yr)	1-in-10 Agriculture Demands (ac-ft/yr)
1	Jonathan Dickinson/ Hobe Sound	3,032	5,123
2	Coastal	558	816
3	The Estuary	643	939
4	C-18/Corbett	6,201	10,478
5	Cypress/PalMar	4,335	7,324
6	The Groves	7,712	13,030
7	Wild & Scenic/Jupiter Farms	792	1,158
	Total	23,273	38,868

Sources: Smajstrla 1990, Moraga et al. 1995, FDEP 1998

Summary of Data from the SFWMD Water Use Permit Database

Water for urban supply, golf courses, landscape irrigation, and agricultural uses is supplied from three sources within the Loxahatchee watershed: surface water systems, the Surficial Aquifer System (SAS) and the Floridan aquifer. Use of the SAS, the traditional source for public water supply, is limited within most of the watershed due to increased potential for impacts on local wetland systems, the Loxahatchee River, and saltwater intrusion. In addition, the Jupiter/Tequesta area is not currently connected to the Central and Southern Florida Project, which provides a backup source of water for the majority of other Lower East Coast communities. For this reason, this watershed is more susceptible to the effects of drought and salt water intrusion during dry periods than other South Florida coastal areas. As a result, several municipalities (Jupiter and Tequesta) have gone to reverse osmosis (RO), utilizing the Floridan aquifer as their primary water supply source.

Northern Palm Beach County is expected to experience significant growth between now and 2020, primarily in coastal areas. In the Northern Palm Beach County planning area, public water supply demands are projected to increase by 63 percent, from 82.2 million gallons per day (MGD) in 1995 to 128.6 MGD in 2020. In contrast, agricultural demands (about 13 MGD) are projected to decrease by about 12 percent by 2020 (SFWMD 2002). No additional agricultural development is predicted to occur – in

fact some existing agricultural lands located near the headwaters of the Loxahatchee River (Loxahatchee Slough) may be displaced by future urban development (e.g., golf courses and residential units).

In this study, public water supply, landscape irrigation and agricultural water demands within the basin were estimated based on: (a) the annual allocation of each permit holder obtained from District records and (b) the average daily demand values used in the Northern Palm Beach County Comprehensive Water Management Plan hydrologic model (MODFLOW). Permitted withdrawals by use category for 1999 are summarized in **Figure O-1** and **Table O-3**. This is the same list of permitted users within the watershed that was used in the well package of the northern Palm Beach County model simulation.

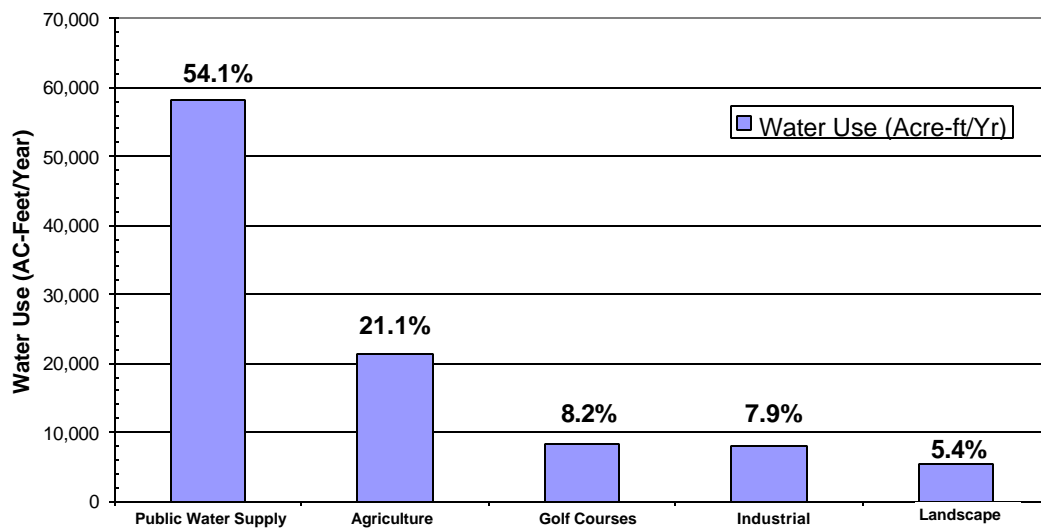


Figure O-1. Water Use in the Loxahatchee River Watershed -1999

Table O-3. Summary of Water Uses within the Loxahatchee Watershed for 1999.

Water Use Type	Million Gallon/Year	Acre-Feet/Year
Urban Water Supply	18,862	58,081
Agriculture	6,943	21,306
Golf Courses	2,705	8,303
Industrial	2,684	8,038
Landscape	1,767	5,422
Total	32,961	101,150

See Table C=1, Appendix C for summary of water use by individual permit

Overall, total urban water supply demands compiled for 1999 were 58,081 acre feet/year (**Table O-3**). The largest users within the watershed consisted of the Seacoast Utilities-Hood Road wellfield (21,631 acre-feet/year), Town of Jupiter (30,825 acre-feet/year), and the Village of Tequesta (5,427 acre-feet/year). Together these utilities represent 53.8% of the total water supply demand within the watershed (**Table O-4**).

Table O-4. Summary of Urban Water Supply Demands within the Loxahatchee Watershed (MGY = Million Gallons/Year)

Permittee	Permit Number	1998 Annual Water Use (MGY)	2000 Annual Water Use (MGY)	1999 Allocations	
				MGY	Acre-feet/yr
Town of Jupiter (PWS)	50-00010-W	3442	3214	10,045	30,825*
Village of Tequesta (PWS)	50-00046-W	589	446	1,768	5,427*
Seacoast Utility- Hood Rd. (PWS)	50-00365-W	4604	4729	7,049	21,631
Palm Beach Park of Commerce	50-01528-W	N/A	N/A	65	198
Total				18,927	58,081

* Both the Town of Jupiter and the Village of Tequesta obtain a majority of their water supply from the Floridan Aquifer

Permitted allocation values were also compared to actual pumpage values submitted to the District by the permit holder to get a comparison of the amount of water actually used during normal operations and what is used during peak demand periods. **Figure O-2** provides a monthly summary of the three identified Public Water Supply permittees within the Loxahatchee basin comparing actual data as a percentage of permit allocations during the period from 1988 to 1999.

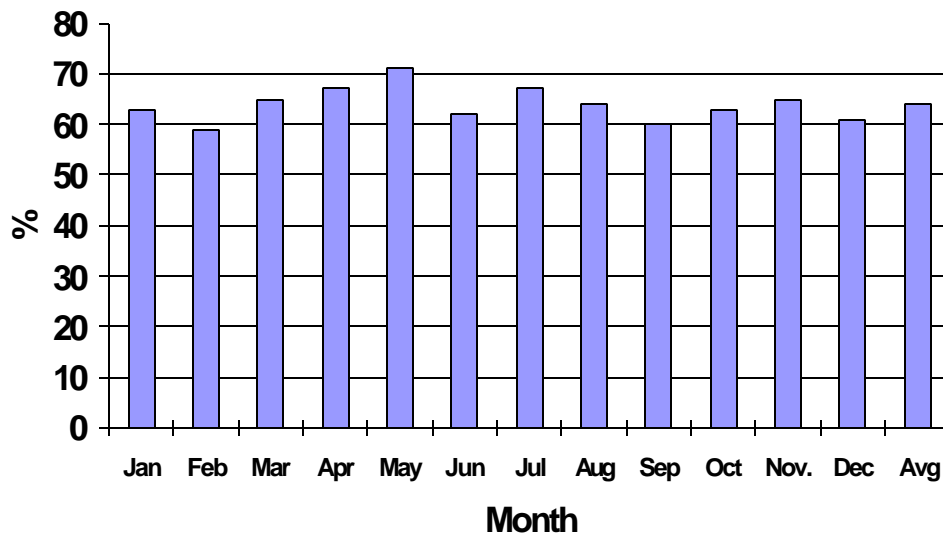


Figure O-2. Total Monthly Water Use by Jupiter, Seacoast (Hood Road Wellfield) and Tequesta expressed as a percentage of the total monthly allocation (996 million gallons per month) for these three Utilities.

In summary the daily averages from the permit were compiled for each month and compared to values submitted from each utility, indicating that the actual pumpage values were, on average, between 60 and 70% of the allocation amount.

Use of traditional sources (surface water and the Surficial Aquifer System) for public water supply and landscape irrigation can be expanded for the Loxahatchee watershed with completion of the proposed water resource development projects outlined within the Lower East Coast Regional Water Supply Plan (SFWMD, 2000) and the Northern Palm Beach County Comprehensive Water Supply Plan (SFWMD, 2002) and more efficient use of regional and local water supplies. However, many of the projects

will not be completed within the next five years. Therefore the SFWMD is placing more emphasis on implementation of a comprehensive water conservation program and the use of alternative sources such as the Floridan Aquifer System and reclaimed water, to help meet water needs during this period. Some public water utilities and golf courses have supplemented their water demand with the use of the Floridan Aquifer System. Development of a regional irrigation water distribution system using reclaimed water is also underway with the users listed in **Table O-5** already on line. Continued development of such alternative sources, increased emphasis on water conservation, along with some changes to wellfield configurations and operations will help meet the 1-in-10 year level of certainty and reduce impacts to the Loxahatchee River and estuary within the next five years.

Table O-5 WATER SUPPLY DEMANDS WITHIN THE LOXAHATCHEE WATERSHED

Martin County			1996 Annual Water Use	1998 Annual Water Use	2000 Annual Water Use	1999 Allocations	
Land Use	Permittee	Permit Number	MGY	MGY	MGY	MGY	Ac-ft/Yr
AGR	SOUTH FLORIDA GRASSING	43-00021-W	N/A	N/A	N/A	289	887
	JENKINS LANDSCAPING	43-00045-W	N/A	N/A	N/A	67	206
	HOBE-ST LUCIE CONSERVANCY DISTRICT	43-00057-W	N/A	3072	5138	4460	13687
	SUNRISE-GULFSTREAM CITRUS GROVES	43-00120-W	N/A	N/A	N/A	545	1673
	SUNSHINE STATE CARNATION	43-00628-W	N/A	N/A	N/A	12	37
	SUN LAND CO	43-00839-W	0	0	0	974	2988
	SOUTH FLORIDA GRASSING INC	43-00893-W	N/A	N/A	N/A	410	1257
Sub Total						6757	20736
GOL	JUPITER HILLS CLUB	43-00054-W ^{wr}	N/A	66	234	58	177
	MARINER SANDS COUNTRY CLUB	43-00064-W ^{wr}	201	586	618	298	914
	CYPRESS LINKS GOLF COURSE	43-00138-W	N/A	N/A	N/A	149	457
	TURTLE CREEK CLUB	43-00140-W ^{wr}	N/A	N/A	?	20	61
	EAGLEWOOD	43-00220-W ^{wr}	56	N/A	N/A	32	98
	JONATHANS LANDING GOLF CLUB, INC.	43-00221-W ^{wr}	104	91	N/A	237	728
	JUPITER ISLAND GOLF COURSE	43-00273-W ^{fl}	92	138	309	16	50
	THE MEDALIST	43-00800-W ^{wr}	?	?	N/A	46	141
Sub Total						855	2625
LAN	LITTLE CLUB CONDOMINIUM ASSOCIATION, INC. THE	43-00202-W	N/A	N/A	N/A	24	75
	LOBLOLLY PINES DEVELOPMENT COMPANY	43-00382-W ^{wr}	N/A	194	184	106	325
	PRESERVE THE	43-00435-W	N/A	N/A	N/A	61	188
	MARINERS SANDS LANDSCAPING	43-00441-W	N/A	3.7	4.9	69	213
	DOUBLE TREE COUNTRY CLUB	43-00632-W	N/A	N/A	N/A	154	473
	JUPITER HILLS HOMEOWNERS ASSOCIATION	43-00722-W	N/A	N/A	64	86	265
	RIVERSIDE MEMORIAL PARK	43-00885-W	N/A	0	N/A	23	70
Sub Total						524	1609

Table O-1. WATER SUPPLY DEMANDS WITHIN THE LOXAHATCHEE WATERSHED

Palm Beach County			1996 Annual Water Use	1998 Annual Water Use	2000 Annual Water Use	1999 Allocations	
Land Use	Permittee	Permit Number	MGY	MGY	MGY	MGY	Ac-ft/Yr
AGR	PARCEL 19.01	50-00547-W	N/A	N/A	N/A	167	511
	C-18 BASIN PROPERTY/MECCA FARMS	50-01626-W	N/A	N/A	N/A	19	59
Sub Total						186	570
GOL	TEQUESTA COUNTRY CLUB	50-00223-W ^{wr}	N/A	N/A	N/A	9	27
	SEMINOLE GOLF CLUB	50-00349-W	80	72	76	80	245
	PGA NATIONAL	50-00617-W	491	281	857	549	1685
	BALLENISLES CC OF JDM	50-00852-W ^{wr}	413	732	1344	171	524
	EASTPOINTE COUNTRY CLUB INC	50-00941-W ^{wr}	N/A	180	162	60	183
	STONEWAL ESTATES GOLF COURSE	50-01110-W	N/A	N/A	133	114	349
	OLD MARSH GOLF CLUB (UNIT 21)	50-01443-W	130	138	171	128	392
	IRONHORSE LAKE WELLS	50-01906-W	?	?	?	160	492
	INDIAN CREEK GOLF CLUB	50-02053-W ^{wr}	N/A	80	N/A	15	46
	IBIS GOLF & COUNTRY CLUB	50-02120-W	N/A	N/A	N/A	397	1219
	PUBLIC GOLF CORP. CITY OF PALM BEACH GARDENS	50-02319-W	N/A	N/A	N/A	40	123
	GOLF AND RACQUET CLUB AT EASTPOINTE	50-02831-W	N/A	180	162	44	135
	JUPITER DUNES	50-03079-W	N/A	46	N/A	39	119
	THE BEAR'S CLUB	50-04391-W ^{wr}	N/A	N/A	N/A	45	139
Sub Total						1850	5678
IND	WASTEWATER TREATMENT PLANT	50-00126-W	0	1.5	1.3	11	33
	TOWN OF JUPITER RECHARGE SYSTEM	50-01584-W	61	2.1	11	0	0
	PRATT & WHITNEY PUMP ADDITION	50-01663-W	N/A	N/A	2250	2466	7568
	NORTH COUNTY AQUATIC COMPLEX	50-02869-W	N/A	N/A	N/A	38	116
	MOBIL OIL STATION 02-F2W	50-02995-W	N/A	11	9.5	12	36
	TRI GAS INC AIR SEPARATION PLANT	50-03722-W	N/A	37	34	93	285
Sub Total						2619	8038

Table O-1. WATER SUPPLY DEMANDS WITHIN THE LOXAHATCHEE WATERSHED

Palm Beach County			1996 Annual Water Use	1998 Annual Water Use	2000 Annual Water Use	1999 Allocations	
Land Use	Permittee	Permit Number	MGY	MGY	MGY	MGY	Ac-ft/Yr
LAN	FRENCHMAN'S CREEK GOLF COURSE	50-00091-W	N/A	N/A	N/A	87	267
	JONATHAN'S LANDING	50-00237-W	208	211	285	319	979
	FPL JUNO BEACH OFFICE BUILDING	50-00742-W	N/A	N/A	N/A	15	46
	SEA OATS OF JUNO BEACH	50-01131-W	N/A	N/A	N/A	16	48
	OCEANSIDE TERRACE	50-01204-W	N/A	N/A	N/A	2	6
	RIDGE AT THE BLUFFS, H.O.A.	50-01282-W	88	104	73	52	158
	RIVER THE	50-01373-W	N/A	N/A	N/A	22	66
	JUPITER BAY	50-01391-W	N/A	4.24	N/A	8	26
	VILLAS OF OCEAN DUNES HOA	50-01392-W	N/A	N/A	N/A	18	56
	CRYSTAL POINTE	50-01442-W	N/A	N/A	N/A	14	44
	CROSSWINDS JUPITER SOUTH	50-01484-W	N/A	N/A	N/A	1	4
	SHORES THE	50-01485-W	N/A	N/A	N/A	0	0
	NORTHPOINT CORPORATE PARK	50-01490-W	N/A	N/A	N/A	34	104
	PALM BEACH PARK OF COMMERCE	50-01529-W	N/A	N/A	N/A	110	339
	ADMIRAL'S COVE AND ADMIRAL'S COVE WEST	50-01552-W	N/A	101	N/A	132	405
	INDIAN CREEK	50-01557-W	18	N/A	24	63	193
	PRATT & WHITNEY - IRRIGATION WATER SUPPLY	50-01664-W	N/A	N/A	N/A	38	116
	HAMPTON'S AT MAPLEWOOD THE	50-01702-W	N/A	N/A	N/A	50	152
	MARQUETTE ELECTRONICS	50-01842-W	N/A	N/A	N/A	5	16
	HIGH SCHOOL "GGG"	50-01955-W	N/A	N/A	N/A	30	93
	PALM BEACH MIDDLE SCHOOL A-A	50-02267-W	N/A	N/A	N/A	21	66
	BALLENISLES DEVELOPMENT	50-02370-W	N/A	N/A	118	70	215
	JUPITER PLANTATION	50-02871-W	N/A	N/A	N/A	15	47
	EASTLAKES PROPERTY OWNERS ASSOCIATION	50-03281-W	47	29	N/A	40	124
	EASTPOINTE PROPERTY OWNERS ASSOCIATION	50-03282-W ^{WR}	72	74	90	70	215
	THE SANCTUARY & FLAMINGO ROAD	50-03401-W	N/A	N/A	N/A	9	28
Sub Total						1243	3813

Table O-1 AVERAGE MONTHLY USE FROM 1988 - 1999 IN MGD(million gallons per day)
LOXAHATCHEE WATERSHED - Large Public Water Supplies

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total Avg.
Jupiter	282.4	260	283	293.5	309.7	273.9	302	286.6	272	287.4	295.7	258.4	283.7
Seacoast Hood WF	301	285.4	316.9	327.5	348.2	295.8	325.5	304.3	286	302.5	301.7	310.1	308.7
Tequesta	41.1	38.2	45.1	47.6	49	44.2	42.9	45.2	39.9	41.9	44.7	42.9	43.6

Average monthly use vs Permit Allocation per month

Jupiter 18.5MGD/555MGpermonth 283.7/555=51%

Seacoast 12MGD/360MGper month 308.7/360=85.6%

(Hood)

Tequesta 2.7MGD/81MGper month 43.6/81=53.8%

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